March 10, 1925. 1,529,317

H. J. F. LUDEMAN

HOLLOW TILE

Filed April 23, 1924

Fig. 4.

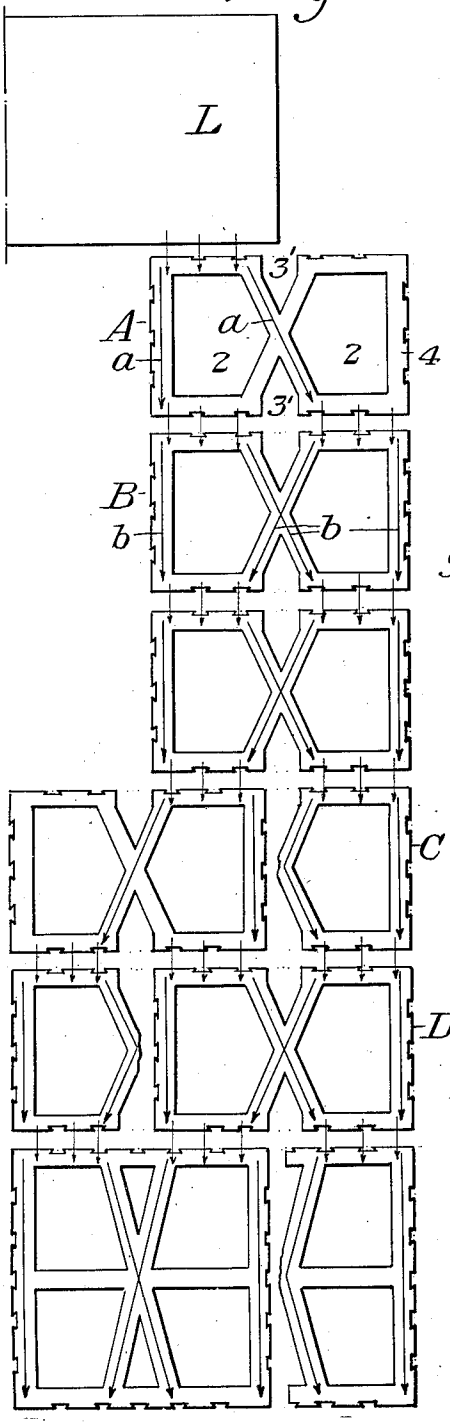


Fig. 1.

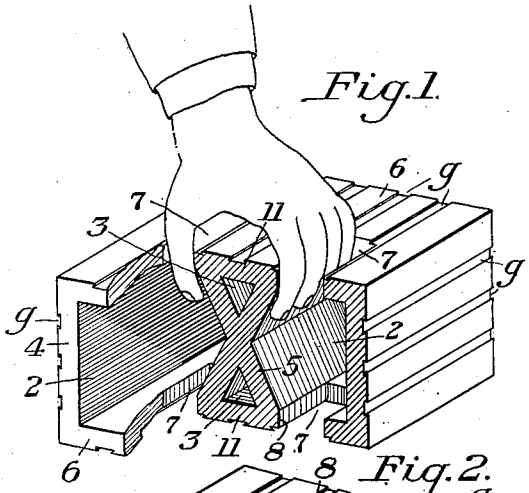


Fig. 2.

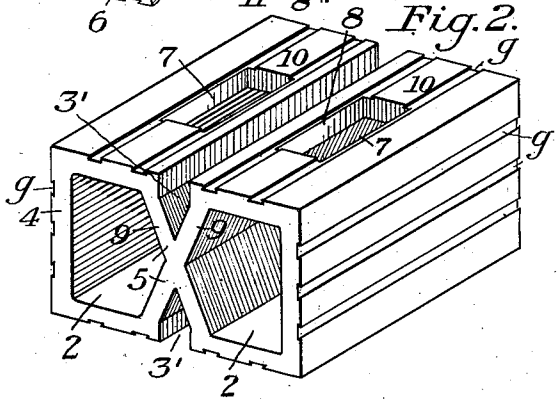
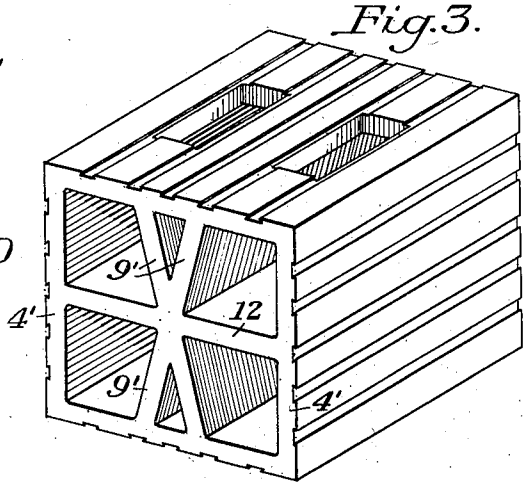


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY J. F. LUDEMAN, OF PITTSBURGH, PENNSYLVANIA.

HOLLOW TILE.

Application filed April 23, 1924. Serial No. 708,402.

To all whom it may concern:

Be it known that I, HENRY J. F. LUDEMAN, a citizen of the United States, residing at Pittsburgh, county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Hollow Tiles, of which the following is a full, clear, and exact description.

The present invention relates broadly to building blocks and tiles, and more particularly to hollow tiles of the character frequently used in connection with bricks for forming walls and the like.

It is customary, at the present time, in the art to which this invention relates to form hollow tiles both by expressing and casting, the tiles being usually formed in two main sizes, the larger of which is 5″ x 8″ x 12″. Such a tile made by expressing will ordinarily weigh approximately fourteen pounds, while a cast tile, due to the difference in materials used and in the thickness of the walls, will ordinarily weigh considerably more. The handling of such tiles, without the provision of some special features, requires both hands, and it is one of the objects of the present invention to provide means expediting the handling and the laying of such tiles.

Tiles as ordinarily constructed for this general purpose have distinct load bearing walls. Quite frequently, however, due to warping or other distortion, such as produced by firing or handling in a green state, a certain number of the tiles must be rejected. If they are used, the load is transmitted initially to one or the other of the horizontally extending faces, causing crushing thereof. By the present invention, the objectionable effects of firing or warping are largely obviated, and the load is concentrated as desired while at the same time providing an effective interlock between adjacent courses.

The invention further contemplates the provision of a tile possessing the foregoing characteristics and so constructed as to transmit an imposed load in such a manner as to distribute the same throughout the thickness of the wall, irrespective of the number of tiles used in its construction.

In the accompanying drawings, there are shown for purposes of illustration only certain preferred embodiments of the present invention, it being understood that the drawings do not define the limits of my invention as changes in the construction therein disclosed may be made without departing either from the spirit of the invention or scope of my broader claims.

In the drawings:—

Figure 1 is a perspective view of one form of tile, partly broken away, and illustrating the manner of lifting the same,

Figure 2 is a view similar to Figure 1 illustrating a slightly modified form of tile,

Figure 3 is a view similar to Figure 1 illustrating still another modification, and

Figure 4 is a view largely diagrammatic representing the manner in which the load is transmitted between adjacent tile courses.

In constructing a tile in accordance with the present invention there is provided a modified form of load bearing walls having such characteristics as to insure ease in handling the tile, together with advantageous transmission and distribution of an imposed load from one tile course to another. These advantages may be obtained by providing a tile having two main horizontally extending side voids 2 with similar vertically superimposed voids 3, as illustrated in Figure 1, or channels 3′, as illustrated in Figure 2. The main side voids in each case are defined by substantially vertically extending side load carrying walls 4 and diagonally extending intersecting intermediate load carrying walls 5, these intermediate load carrying walls forming a substantially X-shaped central body portion.

In the upper and lower horizontally extending faces 6, as well as in the outer or side load carrying walls, there may be provided a series of interlocking grooves *g*, as is customary in the art. In addition to these grooves, there are also provided in the upper and lower faces a plurality of elongated openings 7 in side by side relationship substantially bisected by the transverse axis of the tile and having their own axes at substantially right angles to the axes of the voids 2 whereby the respective openings intersect. The openings 7 also preferably have their major axes substantially parallel to the longitudinal axes of the voids 2 and are so spaced that their inner walls 8 constitute, in effect, a continuation of the sides 9 of the intermediate load bearing walls 5.

The intermediate load carrying walls provide converging-diverging portions, and the

arrangement thereof is preferably such that the width between the walls 8 enables a tile to be easily grasped by inserting the fingers of one hand in one of the openings and the thumb in the other opening. Both the fingers and the thumb may assume a natural position within the tile due to the converging gripping surface provided, this surface at the same time enabling a firm hold on the tile without the exertion of any substantial gripping pressure. These hand holes are preferably provided in both the upper and lower faces of the tile, although, if desired, it will be apparent that they need only be formed in a single face. Such a construction, however, destroys the reversibility of the tile and thereby makes the laying thereof slightly more difficult. The positioning of the hand holes substantially intermediate the ends of the tile and in side by side relationship enables a tile to be easily lifted in a substantially balanced condition whereby the wrist of the mason is not called upon to sustain any considerable strain as is the case where the hand receiving openings are so located as to present an unbalanced condition should the tile be lifted in one hand.

The hand holes may also conveniently be formed of such width that they cut through the upper and lower faces of the tile within the grooves *g*, thereby minimizing the amount of material which must be displaced in forming the same. This construction also removes substantially the central portion of the center rib 10 on each side of the center line in a manner that has been found highly desirable. In handling and firing the tile, they frequently warp to a considerable extent. This warping may be such that portions of the horizontally extending upper and lower faces are thrown so far out of their true positions as to tend to initially concentrate the load thereon, rather than transmit the same directly to the load carrying walls, as intended. By forming the hand holes 7 as described, a considerable portion of each of the horizontally extending faces is removed, the material removed being from positions at which such warping would be most detrimental.

In the form of the invention illustrated in Figure 1 the upper ends of the intermediate load carrying walls are shown as connected by a short web 11, constituting a continuation of the upper and lower faces, while in Figure 2 this web is entirely omitted. Where omitted, it will be apparent that the tile may more easily be broken in half, as illustrated in Figure 4, to form half tiles, while where provided, they give the additional strength desirable during the drying operation.

In Figure 3 the invention is shown applied to a larger unit having intermediate horizontally extending webs 12 extending from the side walls 4′ substantially to the point of intersection of the intermediate load carrying walls 9′.

In Figure 4 there is illustrated a wall constructed of tiles embodying the present invention. This wall is illustrated diagrammatically as supporting a load represented by the beam L. This beam will initially impose its load, for example, on the left hand half of the tile A. This load will be transmitted to the next course, as indicated by the arrows *a*, which, due to the angularity of the intermediate load bearing walls, tends to distribute the load in the next course indicated by the tile B throughout the entire area of the tile. This tile will, in turn, transmit its load through all of the load bearing walls as indicated by the arrows *b*. Thereafter, assuming an increase of the width of the wall as indicated by the course C, the load will be transmitted throughout an area substantially equal to that of a single tile, while in the next course D the load will be distributed throughout the entire width of the wall, as clearly indicated by the arrows. It will be apparent, therefore, that the intermediate intersecting walls not only advantageously adapt themselves to the convenient handling of the tile, but also tend to distribute any imposed load in a highly desirable manner.

It will also be understood that the hand holes form effective interlocks between tiles of adjacent courses as the tiles will preferably be laid in such manner as to break joints in successive courses whereby the hand holes in one course of tiles will come over the unpierced end portions in the course of tiles immediately thereabove and below. The mortar between the tiles will thereby be forced vertically into the hand holes forming interlocking projections of mortar and taking care of any surplus mortar while forming a bond between the tiles.

The advantages of the present invention arise from the provision of a tile which may be easily picked up in one hand with a minimum effort, which may be easily divided to form two half tiles, each representing a cost of exactly half the cost of a full tile, and in which the intermediate load bearing walls serve to effectively transmit and distribute an imposed load.

I claim:

1. A hollow tile having horizontal longitudinally extending voids defined by side and intermediate load carrying walls, said tile having substantially centrally located supplemental openings in overlapping side by side parallel relationship intersecting said voids and forming hand receiving holes, each of said openings having its major axis parallel to the longitudinal axis of the tile, substantially as described.

2. A hollow tile having horizontal longi-

tudinally extending voids defined by side and intermediate load carrying walls, said tile having substantially centrally located overlapping openings in side by side parallel relationship intersecting said voids and forming hand receiving holes, said openings being located on opposite sides of the intermediate load carrying wall structure and having its major axis parallel to the longitudinal axis of the tile, substantially as described.

3. A hollow tile having horizontally extending voids defined by load carrying walls and having in its top and bottom faces supplemental openings intersecting said voids and forming hand receiving holes, said openings being in overlapping side by side parallel relationship, substantially as described.

4. A hollow tile having substantially flat upper and lower load supporting surfaces, an intermediate load bearing wall structure extending between said surfaces and providing converging-diverging faces, there being hand receiving openings extending through said surfaces and cooperating with said converging-diverging faces, substantially as described.

5. A hollow tile having angularly extending intermediate load carrying walls intersecting in substantially the median horizontal and vertical plane of the tile, and having hand receiving openings cooperating therewith, substantially as described.

6. A hollow tile having an intermediate load bearing wall structure providing converging-diverging faces and having hand receiving openings cooperating therewith, said openings having one wall thereof substantially coinciding with the outer faces of the intermediate wall structure, substantially as described.

7. A hollow tile having angularly extending intersecting intermediate load carrying walls and having hand receiving openings cooperating therewith, said openings having one wall thereof constituting a substantial continuation of the outer surfaces of the intermediate load carrying walls, substantially as described.

8. A tile having horizontally extending voids and hand receiving openings intersecting said voids, and said openings having gripping surfaces converging in the direction of extension of the fingers through said openings, substantially as described.

9. A hollow tile having substantially vertically extending side load bearing walls and intermediate load bearing walls forming a substantially X-shaped structure, said tile having hand receiving openings cooperating with said intermediate load bearing walls, substantially as described.

10. A hollow tile having upper and lower walls and having intermediate load carrying walls for transmitting a load from one half of the upper wall to the diagonally opposite half of the lower wall, substantially as described.

In testimony whereof I have hereunto set my hand.

HENY J. F. LUDEMAN.